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52. **The Flower of Yucca and its Fertilization.**—The flowers of all the species are more or less pendulous, open towards evening, and remain wide open through the night and half close in the morning, continuing in that condition until one or two days afterwards, when they drop off, or, if fertilized, wither and become erect. The sagittate anthers open a little before the flowers do, curve backward, and contract to about one-fourth their former size, and thus expel the heavy, somewhat gelatinous pollen-grains, which remain in different little lumps within the flowers. What we usually call the stigma is the style, or rather, the three styles; these together form the stigmatic tube, their edges conniving and their inner sides, the inner coating of the tube, exhibiting the stigmatic surface. This tube is directly connected with the ovarian cells. The pollen, introduced into the tube, begins to develop and to enter upon its functions. But, without artificial aid, it never gets into it. Nocturnal insects are the agents—in our gardens, at least, a white moth of the genus Tortrix. If, about sunset, when the flower is fully open, we take up the pollen-lumps from the flower, and, with a camel-hair brush, well introduce them into the stigmatic tube, we may supply the action of insects wanting in Northern or European gardens, far away from the native home of the Yuccas, and succeed in producing fruit and seed, which thus far are almost unknown in cultivation.

St. Louis, June, 1872. Dr. George Engelmann.

53. **Botrychium matricariæfolium**, A. Braun.—I send you a couple of specimens of this fern, from a locality in the neighborhood of Utica which I found last summer.

I sent specimens to Prof. Eaton, who pronounced it *B. matricariæfolium*, and stated that he had received it from Lake Superior, and from Susquehannah Co., Pa. He also stated that almost the same thing was found in this vicinity several years ago, by Mr. Paine, but that the specimen sent him by Mr. Paine was so imperfect that he passed it over as a form of *B. lanceolatum.*

I have not conferred with Paine about it; but, as he says nothing of it in his catalogue, it seems fair to conclude that he did not know of this locality.

It grows on the sides of a shady ravine some four miles from the city. I found growing side by side with it; *B. Virginicum*, Swartz; *B. Virginicum*, var. *gracile*, Pursh; *B. lunarioides*, Swartz ; *B. lanceolatum*, Angstroem.

The specimens I send were gathered June 29, 1872. The locality is quite limited in extent, but the plant seems abundant. Why has not Prof. Eaton described this species in the Manual? It is the same as Wood's *B. neglectum*, of course.

I found quite a curiosity at the Mud Lake Swamp (Paine's Catalogue) a few days ago—several specimens of *Cypripedium spectabile*, Swartz, with the labellum double, the two being quite distinct throughout, and about two-thirds the size of the ordinary flower, and all the other parts of the flower single. Edwin Hunt.

Utica, N. Y., July 7, 1872.

54. **Bees puncturing Flowers.**—This spring we received from Lewis

Co., N. Y., a package of *Dicentra cucullaria,* DC., the spurs of which had been perforated and cut by humble-bees. We take the liberty of making extracts from the letter of the lady who sent them. "C. went to the woods, and spent several hours watching the bees. The woods were full of Dicentras this spring. He could not find a spike of any species on which there were not one or more punctured flowers. He said the bee lighted on the lowest flower, cut a small hole in the spur with his mandibles, inserted his proboscis, took a sip of the honey, then proceeded to the second flower, where the same operation was performed ; then to a third, when he captured him. [The bee was sent us.] He saw several humble-bees performing this labor, and many honey-bees sucking the honey; but in no instance did he see the honey-bee make the incision, and these were the only insects which visited the flowers during his stay. My *Dicentra spectabilis* and *D. eximia* are now in full bloom. The flowers are greatly disfigured by these punctures. Yesterday I observed a bee for a long time while taking his dinner. The spurs of three or four of the lowest flowers on the long racemes were already punctured. He would fly to a flower, place his feet on each side of the spur, either to press up the honey or to 'hold on' better, insert his tongue for a few seconds, and then fly to the next. Every insertion of his tongue enlarged the orifice; but in no case did he make a fresh incision until the supply of nectar was apparently exhausted. Then, with his strong mandibles, he would nip a hole in a perfect flower as quickly as you could with a pair of scissors. They appeared to know the exact moment when the flower was full-grown and the honey secreted." . . . "The insects, as far as I can discover, do not visit the Adlumia and Fumitory."

55. **Fertilization of Asclepias.**—I notice in the July No. of the *American Agriculturist,* in an article on this subject, the statement that "the point where the filaments or strings which connect them [the pollen-masses] join is very sticky." In the *American Naturalist,* Vol. I., pp. 69, 71, the gland is called "viscid" and "adhesive." In Vol. II., p. 665, of the same work, the pollen is said to adhere "by a glutinous substance." In Vol. III., p. 109, J. Kirkpatrick, who seems to have looked carefully into the matter, attributes the adhesion to the fact that "a hair or claw [?] entering the cleft becomes fast." That this is the case, my own observations, as given on p. 388 of the same volume, confirm. I have never noticed any adhesiveness on the outside of the gland. If a very fine hair is drawn through the cleft, it is caught and lifts out the pollen ; but if the hair be too coarse to enter the cleft, I have never found it to adhere to the outside. The fibres of cotton, or the fine long hairs on many plants—the Asclepias itself—are best for this experiment—none more so than the long, separate hairs on the petiole of *Ambrosia artemisiæfolia.* I have never been able to determine how the hair is held in the gland, whether by some viscid substance contained in it, or by mechanical pressure, and would gladly learn. There is one fact connected with this subject which I do not remember to have seen noticed, and which makes the analogy between the Asclepiads and